REMARKS / ARGUMENTS

Priority

In the Office Action dated June 1, 2004, the Examiner objected under 35 U.S.C. 120 to claims that include references to "...3-dimensional player controlled character...". Three-dimensionality of player-controlled characters is implicit in the terms of art "rendered polygons" and "polygons" which find support in paragraphs [0049], [0063], [0067], and [0075]. This is further argued below on pages 6–7.

In the same Office Action, the Examiner objected to claims 108 and 109 that include references to "...replay of a prior game sequence" or "...preview of a possible future game sequence". Claim 108 (now 206) finds support in paragraphs [0105]–[0106] with reference to Fig. 25 boxes 160, 163, 158, and 165. Claim 109 (now 207) finds support in paragraph [0051]–[0052] with reference to Figures 2 and 15.

In the same Office Action, the Examiner objected to claims directed to "mapping textures onto said first polygon data". This phrase in claims 76, 79, 141, and 155 and the phrase "texture mapped" in claims 80, 141, and 155 (now 174, 177, 178, 239, and 253) find support in the middle of paragraph [0067] as follows:
"The polygons which form the image of hand 37 on LCD 22 are then modified by microprocessor 50 (Fig. 4) to show hand 37 grasping pipe 35 on LCD 22".
This is in the "graphics processing" context of "rendering texture-mapped polygons" in paragraph [0075] and "rendered polygons" in paragraph [0063]. The reference to Fig. 4 is a reference to a block diagram of the portable unit illustrated in Fig. 3.

It is well known in the computer graphics processing art that texture mapping and shading are typical steps in polygon rendering, without which there would be no image to display except a projection of a wireframe model. Based on the examples in applicant's Figures 1, 2, 3, 7, 11, and 23b, where characters are depicted as people and not geometric objects, and references to polygon rendering and texture mapping in applicant's specification, it is clear that texture mapping of polygon data is an important feature of at least one embodiment of the invention that generates pictures of animated texture-mapped characters with body parts that change shape during gameplay, both on portable LCD 22 and on video screen 56.

Paragraph [0062] at top of page 17 specifies that "processor 50 (Fig. 4) recomputes the pixels representing hand 37" and "the polygons which form the image of hand 37 on LCD 22 are then modified by microprocessor 50 to show hand 37 grasping pipe 35" in [0067]. In paragraph [0063] lines 5-6: "console 42 then generates the corresponding sequence of rendered polygons for hand 37 and pipe 35". Clearly, both processors 50 and 86 generate polygons from which pixel data is generated for display on both portable LCD 22 and video screen 56 and "both sequences continue and remain substantially in sync" in the paragraph [0050] example. And paragraph [0075] reminds us that "rendering texture-mapped polygons" may be performed by "specialized coprocessors". Texture mapping of polygon data (vertex coordinates) and rendering to form pictures (pixels) are typical steps in computer graphics.

Therefore, sufficient §120 support is provided in applicant's priority application 09/853,487 filed May 10, 2001 for the "mapping textures" and "texture mapping" elements in applicant's claims 76, 141, and 155 (now 174, 239, and 253).

Claim Objections

Spelling errors in claims 80 and 132 have been amended in claims 178 and 230.

Claim Rejections - 35 USC §112

In the Office Action dated June 1, 2004, the Examiner rejected claims 76–173 under 35 USC 112, first paragraph as failing to comply with the written description requirement. Specifically, the Examiner rejected claims 76–173 for including "... 3-dimensional player-controlled character..." a phrase that is not present in the specification. The player characters are clearly 3-dimensional because they are constructed from rendered polygons in both portable and console systems as specified in paragraph [0067] "polygons which form the image of hand 37 on LCD 22 are then modified by microprocessor 50" and "microprocessor 86 (Fig. 16) modifies corresponding polygons which form the image of hand 37". 3-dimensionality of polygon vertex data is implicit in the terms of art "rendered polygons" and "polygon" and "rendering" in paragraphs [0063], [0067], and [0075] in applicant's specification.

In the same Office Action, the Examiner rejected claims 76–173 under 35 USC 112, first paragraph for including the phrase "...textures onto said first polygon data..." in the claims. This phrase finds support in paragraph [0075] "rendering texture-mapped polygons, ... and related graphics processing" in the specification.

It is well known in the video game art that polygons are not what game players see on their TV screens and portable LCD screens, except in rare instances where wireframe models are displayed. What players normally see are displayed projections of shaded texture data (texture elements or generated textures) that is

recomputed from a variable perspective to conform to a variable numeric model that includes vertex coordinates defining boundaries of 3-dimensional surface areas of characters and other objects represented in digital data memory. Texture mapped polygons is a term of art typically meaning texture data that is recomputed to conform to such numeric models of polygon vertices.

"Texture-mapped polygons" are taught in applicant's paragraph [0075]. Paragraph [0067] teaches that "polygons which form an image of hand 37" of a player-controlled character [0053] "are then modified ... to show hand 37 grasping pipe 35" for display on both LCD 22 and video screen 56. Examples of the displayed results of this texture mapped polygon data are illustrated in Figures 2, 7, and 11. Therefore, the phrase "... mapping textures onto said first polygon data" and the phrase "... 3-dimensional player-controlled character" find support in the specification.

The polygon rendering process is described in US 6,697,074 with reference to Fig. 5 and texture mapping is described in US 6,342,892. There is no mention of "sprite" or "sprites" in either reference. Sprites are a separate USPTO class/subclass 345/683.

In the Office Action dated June 1, 2004, the Examiner rejected claims 81, 84, and 116 under 35 USC 112, second paragraph as being unclear regarding the meaning and/or scope of the words "variable" or "data" with the language "other variables" or "and/or other data" in the claims.

Claims 81, 84, 107, 116, 123, 150, and 151(renumbered as 179, 182, 205, 214, 221, 248, and 249) are amended as Markush Group claims that include the phrase "from the group comprising". The words "and/or" have been deleted from the claims.

In the same Office Action, the Examiner rejected claims 88 and 154 as unclear. Applicant has amended renumbered claims 186, 252, and 270 to change "is partly wireless" to "comprises wireless transmission."

In the same Office Action, the Examiner rejected claims 114 and 124 as unclear. Renumbered claims 212 and 222 are more clearly worded.

In the same Office Action, the Examiner rejected claims 90, 147, and 159 as unclear as to what "substantially the same character" describes. Applicant offers the following explanation of claims 90, 147, 159 (renumbered as 188, 245, 257): If an image of a famous trademarked character such as Mickey Mouse is generated for display on TV screens and a reduced-resolution image of Mickey Mouse is also generated for display on a portable LCD screen, most people who have previously seen images of Mickey Mouse will accept that the same character is being displayed on both screens. However, there are usually differences in resolution, color, texture, line width, loss of detail, aspect ratio changes, point of view, clipping, perspective distortion, image changes to simulate shadows, illumination, light flashes, darkness, fog, night vision, rainfall, disguises, emotional expressions, false color, clothing, and other differences. Applicant referred to some of these differences in paragraphs [0100] and [0101] with reference to Figures 22, 23a, 23b, and 23c.

Regardless of these differences, if two different images of a character depict the same character for trademark or copyright enforcement, then they are "substantially the same character" for claims 188, 245, 257. Likewise for claims 189 and 246 which refer to "substantially the same game world."

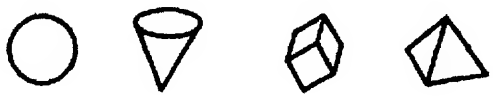
Claim Rejections - 35 USC §103

In the Office Action dated June 1, 2004, the Examiner rejected claims 76, 141, and 155 and claims dependent thereon under 35 USC 103, as being unpatentable over Fujimoto et al (US 6,238,291) in view of Miyamoto et al (US 6,626,760) and in further view of Miyamoto et al (US 2002/0165028) referred to as '291, '760, and '028 respectively.

As indicated by the Examiner, Fujimoto '291 teaches a Nintendo 64 (100) connected to a Gameboy (400) which display separate images on a TV screen (600) and on a private handheld LCD screen (401), but is silent regarding incorportation of textured polygon characters. Miyamoto '028 teaches the ability of the Gameboy Advance (100) portable game system to display a 3-dimensional world and character on a portable LCD screen (20) separate from the TV screen (300). According to the Examiner, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to replace the Gameboy (400) of '291 with the Gameboy Advance (100) of '028 to increase the display abilities of the connected portable.

Although substituting the sprite-based Gameboy Advance (100) for an older model sprite-based Gameboy (400) would be obvious, neither reference '291 nor '028 suggests textured-mapped polygons, an essential element of applicant's claim 174. Miyamoto '028 refers repeatedly to "characters", but the characters in '028 are mere geometric objects illustrated as follows from Fig. 9(c) of '028:

(C) CHARACTER DATA FOR PORTABLE GAME MACHINE



Such geometric objects and other objects, some with polygon facets, are generated in the Gameboy Advance in '028 as 2-dimensional sprites by image processing unit 22 (RCP co-processor). The internal structure of co-processor 22 is not specified in '028, but is described in detail in US 2004/0053691 (Kawase). In Kawase '691, a Gameboy Advance is illustrated in Fig. 1 and is identified as such in paragraph [0049] in '691. The image co-processor in Gameboy Advance 1 in Kawase '691 is a sprite processor and does not render textured polygons in any of the cited references.

With reference to the block diagram Fig. 2 in Kawase '691, the Gameboy Advance sprite co-processor consists of Background (BG) process unit 210, object (OBJ) process unit 212, and image synthesis process unit 213 which drives LCD 11. Paragraph [0056] in '691 refers to "the hand-held game machine 1 [which] performs a so-called sprite process by using the BG process unit 210 and the OBJ process unit 212 to generate a game image." Figures 6, 8, and 18 clearly depict sprites. The characters illustrated in Figures 5A, 5B, 11A, and 11B appear flat because they are generated by "a so-called sprite process" in the Gameboy Advance.

The word "polygon" does not appear in Miyamoto '028 or Kawase '691 or in several other Nintendo patent applications that describe the "Gameboy Advance", such as 2004/0110563, 2004/0106456, 2004/0087369, and 2004/0005928.

Moreover, the word "polygon" is not mentioned even once in two Internet web sites that provide very detailed technical descriptions of the Gameboy Advance. These web sites describe Gameboy Advance hardware interupts, BIOS calls, graphics modes 0 through 5, bit-by-bit descriptions of the Program Status Register and color

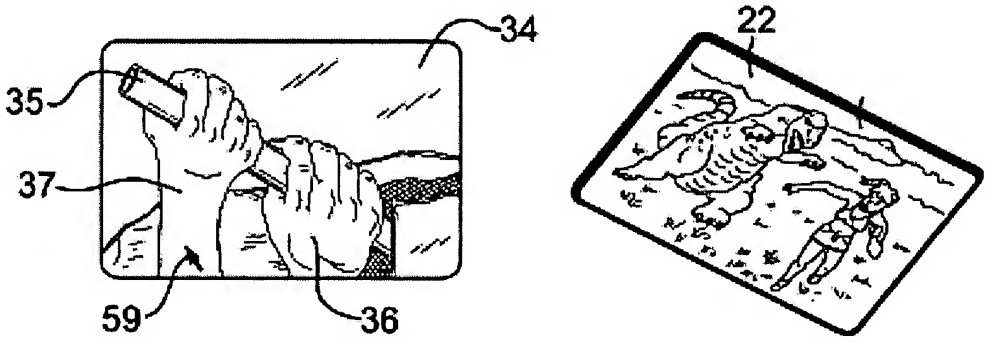
palette RAM, and a section on Sprites: "The GBA supports 128 simultaneous sprites. These can be up to 64x64 pixels in size. The OAM, which starts at 0x07000000, has one entry for each of the 128 sprites." It then describes sprite attributes bit-by-bit for more than 3 pages. But not a word about polygons anywhere in the two documents. These Gameboy Advance documents may be found at:

www.jharbour.com/gameboy/GBA_02.pdf and

www.cs.rit.edu/%7Etjh8300/CowBite/CowBiteSpec.htm

The triangles and squares on the cube and pyramid illustrated in Miyamoto '028 Fig. 9(C) are clusters of pixels in 2-dimensional sprites and do not suggest the texture-mapped polygon process of applicant's claim 76. Clearly, it was not obvious on applicant's priority date to render texture mapped polygons to generate pixels in images on a sprite-based portable game system LCD screen.

Unlike the geometric objects of '028, applicant's "characters" resemble people or animals or monsters or their body parts such as hand 37 displayed on portable LCD screen 34 or 22, as illustrated in applicant's Figures 2 and 4:



These animated characters are generated from texture-mapped polygons according to applicant's paragraph [0067]: "Fig. 11 shows hand 37 shaped as a fist... The polygons which form the image of hand 37 on LCD 22" and in paragraph [0075] "rendering texture-mapped polygons... and related graphics processing" which is a different technology than the sprites used in the Gameboy Advance.

Claim 76 (renumbered 174) is limited to characters that are texture mapped from non-sprite polygon data (polygon vertex coordinate data) that represents a surface shape of, for example, "hand 37 shaped as a fist." It is well known that polygon vertex data is not typically displayed – rather the mapped textures are displayed. Even if, for the sake of argument, the polygons displayed on the pyramids and cubes in '028 Fig. 8(B) were texture mapped, the polygon data in the sense used in claim 174 (vertex coordinates and attributes) is not displayed during game play and this is reflected in the structure of claim 174 which specifies display of textured portions of player-controlled characters, but not display of polygon data. Polygon data is a unique data type that is structurally different from the data type representing sprites.

The words "polygon" and "texture" do not appear anywhere in Miyamoto '028 and texture mapping of polygons is not shown, described or remotely suggested in '028.

Polygon rendering is a term of art that refers to a digital process that converts a list or array of polygon vertex coordinates (x, y, z) and attributes (colors, etc) into a 2-dimensional matrix of pixels for display as a picture. Rendering of such polygon vertex data consists of several steps that are repeated whenever changes in shape of a character's arms and legs and body are simulated by changes to vertex coordinates in the polygon data. Texture mapping is typically one of these steps.

Inherent in the term "polygon rendering" is a list or array of polygon vertex coordinates and attributes which are rendered by the rendering process, i.e. converted into picture data (pixels). Vertex coordinates are typically not displayed and are not sprites. Although the term "vertex" is not explicitly used in applicant's specification, polygon vertex data is inherent in the term "rendered polygons" in paragraph [0063] in which processor 86 generates picture data (146 in Fig. 24 left) for display on TV screen 56, and "polygons" in paragraph [0067] in which processor 50 generates picture data (146 in Fig. 24 right) for display on LCD 22 in portable game system 28. Rendering of texture-mapped polygons in mentioned in paragraph [0075].

Claim 174 step (e) is limited to display of a textured portion of a character that was texture mapped based on polygon vertex coordinate data generated in step (d) in a portable game system. Steps (d) and (e) in claim 174 distinguish over sprites processing in prior art portable game systems such as the Gameboy Advance because sprites are already textured and require no further texture mapping or use of polygon data in the sense used in applicant's application and claim 174.

It is well known that the Nintendo 64 video game system 100 in Fujimoto '291 and the Nintendo GameCube video game system 200 in Miyamoto '028 are both capable of performing texture mapping of polygon vertex data that represent characters and other 3-dimensional objects. Both systems have a graphics coprocessor or an image processing unit which was designed to render texture mapped polygon data. In contrast, the image processing unit in the Gameboy Advance in '028 was not designed as a polygon rendering coprocessor, but instead was designed for processing sprites, bitmaps, and tiles.

Combining the subject matter of Fujimoto '291 and Miyamoto '028 would not result in a system that could perform all of the steps in applicant's claim 174. Specifically, such a combination would not perform steps (d) or (e) in claim 174, i.e. generating polygon data (vertex coordinates) that represents a shape of a portion or body part of a character and texture mapping the polygon data to generate a textured portion of the character for display in a "portable game system" as recited in claim 174. Hence, it would not have been obvious in May 2001 to achieve steps (d) and (e) in applicant's claim 174 by combining the teachings of '291 and '028.

Even if, for the sake of argument, the Gameboy Advance in Miyamoto '028 were capable of generating texture mapped polygon vertex data, the geometric objects said to be "characters" in '028 and illustrated in Figures 2, 3, 4, 5, 8, and 19 in '028 teach away from texture mapped polygon vertex data because they are not textured in the drawings, and are not described as textured in the specification, and are not based on a 3-dimensional mesh of polygon vertices, in the sense used in conventional polygon rendering technology. Therefore the use of textured polygons was not obvious in the suggested combination of Fujimoto '291 and Miyamoto '028 in which sprites, not textured polygon vertex data, are used for player characters in the Gameboy Advance.

If displaying characters rendered from textured polygon vertex data for display on a portable LCD game system linked to a console system were obvious to '291 or '028 co-inventors, why did they not provide even one example in the drawings? This would be a strange omission if it were obvious to display textured characters on a portable LCD based on rendered polygons in the manner described by Miyamoto '760 for display on a TV screen.

The priority date for Miyamoto '028' was May 2, 2001, only 8 days before applicant's priority date of May 10, 2001. Miyamoto '028 therefore gives us an accurate look at the state of the art as seen by game experts at the same time as applicant's application. In '028 the "characters" for display on a Gameboy Advance LCD were cubes, pyramids, cones, and other geometric sprite objects, not characters generated from polygon vertex arrays. Even as recently as May 2, 2001, it was still not obvious to Miyamoto and co-inventors that rendering textured polygon vertex data to generate characters for display on portable LCD screens would be a significant improvement or appropriate for sprite-based portable game systems linked to console systems.

In an earlier Miyamoto patent (US 6,139,433, Figures 1, 25, 27E-27J) and several other patents for non-linked video game systems, Miyamoto showed the Nintendo character Mario in the drawings as examples of textured polygon characters generated by the console game system for display on a TV screen. But in May 2001, when Miyamoto, the game expert who invented Mario, chose examples of characters to illustrate LCD displays in the multi-system game apparatus described in Miyamoto '028, he chose untextured geometric objects instead of Mario as illustrative characters. If it were obvious to generate player characters from polygon vertex data for LCD display in linked game systems, why did Miyamoto choose geometric sprite objects instead of his Mario character generated from polygon vertex data? Clearly, it was not obvious to Miyamoto or his co-inventors to generate player characters from polygon vertex coordinate data in a portable game system designed for sprites when linked to a console game system that does generate player characters from polygon vertex coordinate data.

In the Office Action dated June 1, 2004, the Examiner rejected claims 76, 141, and 155 and claims dependent thereon under 35 USC 103 as being unpatentable over Fujimoto '291 and Miyamoto '028 in view of Miyamoto '760. As indicated by the Examiner, Miyamoto '760 teaches a game system (Nintendo 64) that generates player characters and other objects from textured polygon vertex data. The word "polygon" appears 14 times in '760. Figures 12 and 13 in '760 illustrate player-controlled objects that are "characters" as the term is used in applicant's claims.

The Nintendo 64 that renders textured polygon vertex data in Miyamoto '760 is the same Nintendo 64 used in Fujimoto '291 where it is connected to a Gameboy. Miyamoto '760 does not mention a portable game system or a data link thereto. Even if, for the sake of argument, the teachings of '291 and '760 and '028 were combined, as suggested by the Examiner, and the textured polygon vertex data processing in the N64 console in '291 and '760 were equivalent to the textured polygon vertex data processing in GameCube 200 in '028, the combined system would not satisfy the limitations of applicant's claim 174.

A game system combining the teachings of '291 and '760 and '028 would perform steps (a), (b), and (c) recited in applicant's claim 174. However, steps (d) and (e) in claim 174 are not suggested by a combination of '291 and '760 and '028. Combining these references does not show, describe, or remotely suggest generating polygon vertex data in a portable game system and texture mapping the polygon data in the portable game system to generate a textured player-controlled character for display on an LCD in the portable game system in accordance with data transmitted from the video game machine that also generates polygon-based textured characters.

Applicant's invention alone achives the realism and 3-dimensional movement of characters generated by polygon rendering in a portable game system.

Figures 12 and 13 in Miyamoto '760 show characters constructed from textured polygon vertex data, but these are generated by video game machine 10 for display on CRT 30 (TV). Figures 1 and 2 in Fujimoto '291 show a video game machine connected to a Gameboy 400, but the only examples of images for display on LCD 401 in Gameboy 400 are rectangular tiles 611 in Figures 9(A-B). Figures 4, 5, and 9(c) in Miyamoto '028 show "characters" displayed on LCD 20 in a Game Boy Advance 100, but these "characters" are sprites representing geometric objects and are not textured. There is no suggestion in any of the references that a portable game system may generate polygon vertex data and texture map the polygon vertex data to generate a textured character that is displayed on an LCD in the portable game system.

Even if, for the sake of argument, the graphics coprocessor used in the GameCube were designed into the Gameboy Advance for generating textured polygons, this design would be very impractical, because the GameCube co-processor consumes enough energy to require a special heat-radiator described in US patent 6,565,444 which in column 6 lines 37–38 states "the image processing unit 43 is the greatest in heat generation". The prior art therefore teaches away from the suggested combination by placing polygon rendering solely in a non-portable game system.

"Portable game system" is a term of art that includes being powered by a battery for portability. In a portable game system, large energy consumption would inevitably result in very short battery life which would make the portable game product unmarketable. The Nintindo 64 system described in '760 and the GameCube

described in '028 are not portable game systems and therefore do not have the low power consumption circuitry required for a battery powered portable game system that operates independently of 110 vac electric power.

It would be impractical to transplant a high energy consuming graphics co-processor from a video game system that is powered from an electric wall socket, and design the power hungry co-processor into a portable game system powered by batteries that require low power consumption.

In the Office Action dated June 1, 2004, the Examiner rejected claims 92, 93, 137, 138, 170, and 171 under 35 USC 103(a) as being unpatentable over Fujimoto '291 in view of Miyamoto '760, Miyamoto '028, and Ng (US 5,971,855). As indicated by the Examiner, Ng teaches two connected mobile game systems and the presentation of both game characters on the mobile game systems with LCD displays.

In response to the Office Action, applicant's rewritten claim 174 is limited to portable game systems that generate polygon data (vertex data) and that map textures onto the polygon vertex data to represent a textured player character. The words "polygon" or "texture" do not appear in Ng. According to Ng the mobile "game 200 is powered by 3 volt battery 213" shown in Fig. 2A. The resulting low power requirement would prevent application of the teachings of Miyamoto '760 or Miyamoto '028 regarding energy consuming co-processors for rendering polygons to the battery-powered game system of Ng. Moreover, there is no suggestion in Ng that any of its components would be capable of generating textured characters from polygon vertex data. Therefore, it would not be obvious to achieve the structure of applicant's claim 174 by combining the teachings of Ng, '291, '760, and '028.

The cited references illustrate how game experts overlooked the present invention because they regarded a data linked portable game system as an LCD-equipped controller of the linked console game system. In US patent 6,132,315, column 11, lines 60-62, Miyamoto said: "the game play ... may be implemented by using the first-machine" [GameBoy] "in place of the controller". As long as they regarded the linked Gameboy as a smart controller, they overlooked the possibility of displaying textured characters on portable LCD screens based on polygon vertex arrays.

A more recent example of this mindset may be found in Aonuma (2003/0216177) which shows polygon-based characters in Figures 5 and 6 for display on a TV screen, but belittles the LCD screen as "a 2-D map screen." Aonuma refers to the LCD screen as "the 2-D map screen" 38 times, as if displaying maps was the only function of an auxiliary LCD screen. Aonuma mentions polygons in paragraphs [0004], [0070], and [0081] but only in connection with display on a TV screen. Aonuma's priority application was filed on May 17, 2002, more than one year after applicant's priority date. Applicant's invention was still not obvious one year after applicant filed his priority application.

Because portable game systems were stereotyped as LCD-equipped controllers and map screens in linked systems, the possibility of portable game systems providing auxiliary displays of polygon-based textured characters in linked systems was overlooked. The long-standing assumption in the prior art that portable game systems would not provide polygon-based characters when linked to video game systems that do provide polygon-based characters, is evidence that applicant's invention was not obvious.

None of the cited references show, describe, or suggest that the LCD in a portable game system that is linked to a console should display polygon-based characters. In stark contrast, applicant's specification on page 16 lines 21-24 clearly states that "The polygons which form the image of hand 37 on LCD 22 are then modified by microprocessor 50 (Fig. 4) to show hand 37 grasping pipe 35 on LCD 22."

Providing textured polygon-based graphics in linked portable game systems was not suggested in the cited prior art because applicant's invention was not obvious to video game experts.

Applicant's invention is classified in a crowded art and therefore the novel, non-obvious improvements defined by the present claims should be regarded as significant.

Arguments directed above to claim 174 may also be directed to independent claims 239 and 253 and claims dependent thereon.

Objections that the Examiner raised against other dependent claims are believed to be moot given the allowability of the independent claims.

For these reasons, it is clear that applicant's examined claims as rewritten and renumbered as 174–271 define an invention that is novel, non-obvious, and a significant advance over the prior art.

New Claims

In the Office Action dated June 1, 2004, the Examiner rejected claims which have been rewritten as claims 174, 239, 253 and claims dependent thereon which are now believed allowable. In these claims, texture mapping of non-sprite polygon data are essential elements.

Applicant further submits new claims 272 and 291 which omit texture mapping and focus on polygon rendering for which there is ample support in applicant's priority application in paragraphs [0049], [0063], [0067], and [0075].

The expression "polygon rendering" is a term of art for a technology that originated in the 1970's and encompasses several subclasses under US class 345. More than 230 US patents have been issued that use the expression "polygon rendering". Polygon rendering from polygon vertex data in a console game system is described in Miyamoto '760 and corresponds to step (b) in applicant's claims 272 and 291.

Polygon rendering is a digital process that converts polygon vertex data, which is a list or array of polygon vertex coordinates (x, y, z) and attributes (colors, etc), into a 2-dimensional matrix of pixels for display as a picture. As used in applicant's claims, the pixels are not the polygon vertex data. The polygon vertex data is not a picture or pixels or bitmaps. The polygon vertex data is a different data type than the sprites data type. A sprite (class 345/683) is a 2-dimensional matrix of pixels which move relative to a background for display as a picture. If a displayed sprite happens to depict a triangle, that triangle is not stored as the polygon vertex data type referred to in applicant's claim 272 which distinguishes over sprites.

Inherent in the term "polygon rendering" is processing of polygon vertex coordinates and attributes which are rendered by the rendering process, i.e. converted into picture data elements (pixels). Although the term "vertex" is not explicitly used in applicant's specification, polygon vertex data is inherent in the term "rendered polygons" in paragraph [0063] in which processor 86 generates "rendered polygons for hand 37 and pipe 35" for display on TV screen 56, and in paragraph [0067]: "The polygons which [are rendered to] form the image of hand 37 on LCD 22 are then modified by microprocessor 50 (Fig. 4) to show hand 37 grasping pipe 35 on LCD 22" in portable game system 28.

The very next sentence in paragraph [0067] has parallel language:
"... microprocessor 86 (Fig. 16) modifies corresponding polygons which [are rendered to] form the image of hand 37 in the generated video images displayed on TV 11 (Fig. 16)." The words "rendered polygons" in paragraphs [0049] and [0063] clearly indicate that the process in video game console 42 is the well known polygon rendering process which forms picture data (pixels) from polygon vertex data to represent hand 37 and pipe 35. A similar polygon rendering process is also used in processor 50 in the portable system (for the same hand 37 and pipe 35) according to paragraph [0067]. This is clearly distinct from a sprite process.

These similar processes are reflected in the language of claim 272. In applicant's claim 272, steps (d) and (e) repeat language similar to that used in steps (a) and (b). If it were argued that step (d) refers to a sprite or bitmap picture of a polygon, then the similar language in step (a) would also read on a sprite or bitmap picture of a polygon, an interpretation that is clearly excluded by the term of art "rendered polygons" in paragraphs [0049] and [0063] and "polygons" in paragraph [0067].

Arguments directed above to claim 272 and 174 may also be directed to claim 291, and claims dependent thereon.

Therefore, applicant's claims 272, 291, and claims dependent thereon, distinguish over the cited references and are not obvious for reasons given above with reference to claim 174.

For these reasons, it is clear that applicant's pending claims 272–299 define an invention that is novel, non-obvious, and a significant advance over the prior art.

Summary

1. None of the cited references suggest features uniquely claimed by applicant, namely, texture mapping of rendered polygon vertex data to generate characters in a 3D world for display on an LCD in a portable game system.

2. Combining the teachings of the cited references would not result in the game system defined by applicant's claims.

3. Applicant's invention uses portable game systems in a new way that was not described in the prior-art.

4. Applicant's invention uniquely solves a long-standing problem, i.e. how to display realistic characters in a 3-D world on an auxiliary LCD.

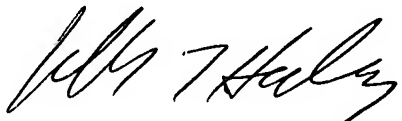
5. Applicant's invention was not obvious to game experts at the time applicant's priority application was filed.

6. 3-dimensional video games are a crowded art and therefore applicant's unanticipated step forward is significant.

Applicant submits that the present pending claims are allowable and a favorable decision is respectfully requested.

Respectfully submitted,

GRAYBEAL JACKSON HALEY LLP



Jeffrey T. Haley
Registration No. 34,834
155 - 108th Avenue N.E., Suite 350
Bellevue, WA 98004-5901
(425) 455-5575